NON-PUBLIC?: N
ACCESSION #: 9310190104
LICENSEE EVENT REPORT (LER)

FACILITY NAME: DONALD C. COOK NUCLEAR PLANT - UNIT 2 PAGE: 1 OF 03

DOCKET NUMBER: 05000316

TITLE: REACTOR TRIP FROM THE REACTOR PROTECTION SYSTEM DUE TO A
STEAM FLOW/FEED FLOW MISMATCH COINCIDENT WITH A LOW LEVEL IN NO. 4 STEAM GENERATOR
EVENT DATE: 08/27/93 LER #: 93-008-00 REPORT DATE: 09/27/93

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 090

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: G. A. WEBER - PLANT ENGINEERING SUPERINTENDENT TELEPHONE: (616) 465-5901

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: JK COMPONENT: IB MANUFACTURER: F180
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On A
gust 27, 1993, at 0502 hours with Unit 2 in Mode 1 (Power Operation) at 90 percent Rated Thermal Power, a Reactor Trip occurred from a Steam Flow/Feed Flow Mismatch coincident with a low level in the No. 4 Steam Generator. These conditions were the result of an uncontrollable speed decrease on the East Main Feed Pump (MFP) Turbine. An investigation revealed that the loss of speed control was the result of a malfunctioning Current-to-Current Repeater (I/I). I/Is were installed in both the East and West MFP Turbine speed control circuits on August 13, 1993 via a Temporary Modification (TM). This action was taken following diagnosis of a ground condition which was interfering with the transfer of the turbine speed control circuit from manual to the automatic control

mode. Post modification testing and power operation following installation of the TM demonstrated that the TM had isolated the grounding problem from the speed controller and had restored proper functioning of the control circuit. Following the trip, troubleshooting of the East MFP speed control circuit found that the I/I was malfunctioning.

The defective I/I was replaced on August 30, 1993. Following replacement of the I/I, circuit checks revealed inconsistencies which ultimately led to a decision to remove the TM. The East and West MFP speed control circuits were returned to their original design on September 12, 1993. The control mode transfer problems caused by the ground condition are being controlled administratively. Trouble shooting of the ground and subsequent repairs are scheduled for completion during the next Unit 2 Outage of sufficient duration.

END OF ABSTRACT

Condition Prior to Occurrence:

Unit 2 was in Mode 1 (Power Operation) at 90 percent Rated Thermal Power.

Description of Event:

On August 27, 1993 at approximately 0500 hours, Operators observed the East Main Feed Pump (MFP) (EIIS/SJ-P) decreasing in speed. The Operators response to the East MFP condition was to decrease Reactor Power and take manual control of the MFPs. The East MFP did not respond to the manual attempts to increase speed and restore feedwater flow. The West MFP (EIIS/SJ-P) did respond, but could not fully compensate for the loss of flow through the East pump.

At 0502 hours, a Reactor (EIIS/JE) Trip occurred from a Steam Flow/Feed Flow Mismatch coincident with a low level in the No. 4 Steam Generator (EIIS/AB-HX).

Following the Reactor Trip, all Engineered Safety Feature systems functioned as required. one equipment abnormality was noted during the event. A spurious Chemical Volume Control System (CVCS) (EIIS-CB) Letdown Isolation resulted in a low level in the Volume Control Tank, which provides the normal supply to the Centrifugal Charging Pump (CCP) (EIIS/CB-P). Operators realigned the CCP suction to the Refueling Water Storage Tank (EIIS/BP-TK). Following restoration of the CVCS Letdown line-up, the CCP suction was realigned to the Volume Control Tank

(EIIS/CB-TK).

This event was reported as a Four Hour Report to the U.S. Nuclear Regulatory Commission Operations Center, as required by 10 CFR 50.72(b)(2)(ii). In the Four Hour Report, it was stated that the reactor protection actuation occurred at 0502 hours, and that the West MFP tripped on high exhaust hood pressure. Upon further review, it was confirmed that the reactor protection actuation (Reactor Trip) occurred at 0502 hours and the West MFP tripped as the result of the Reactor Trip. A High MFP Turbine Exhaust Hood Pressure Alarm was received prior to the Reactor Trip. The MFP Turbine trips at the High-High Exhaust Hood Pressure Setpoint. This trip setpoint was not reached during the transient. The Four Hour Report error was a result of misinterpreting the High Exhaust Hood Pressure Alarm as an indication of a MFP Turbine High-High Exhaust Pressure Trip, during the initial post-trip review of the operations Sequence Monitor printout.

Cause of Event:

The decreasing speed of the East MFP was the initiating event leading to the Reactor Trip. The speed reduction of the East MFP was caused by the malfunctioning of the Current-to-Current Repeater (EIIS/SJ-IB) in the East MFP speed control circuit. The cause for the malfunction has not been determined. The Current-to-Current Repeaters were installed in both the East and West MFP automatic speed control circuits on August 13, 1993, via a Temporary Modification. The purpose was to provide isolation between the pressure setter and the control circuit, protecting the control circuit from a ground problem in the pressure setter.

The cause for the spurious CVCS Letdown Isolation could not be determined.

Analysis of Event:

This report is being submitted in accordance with 10 CFR 50.73, paragraph (a)(2)(IV), as an event that resulted in an unplanned automatic actuation of the Engineered Safety Features, including the Reactor Protection System.

The automatic protection responses, including the Reactor Trip and the associated Engineered Safety Features functioned properly as a result of the Reactor Trip.

Corrective Actions:

The defective I/I was replaced on August 30, 1993. During post-maintenance checks of the East MFP control circuit, inconsistencies were discovered which prevented the automatic operation of the East MFP. This ultimately led to a decision to remove the TM for the speed control circuits of both the East and West MFPs. The grounding problem which interferes with proper transfer of the MFP Turbine speed control circuit from manual to the automatic mode of operation still exists. Should it be necessary to place the pumps in manual, their return to automatic will be provided with the assistance of I&C personnel under Administrative Controls. No other mode of controller operation is adversely affected by the grounding problem. Troubleshooting of the ground and subsequent repairs are scheduled for completion during the next Unit 2 Outage of sufficient duration.

Failed Component Identification:

Component Name: Current-to-Current Repeater

Manufacturer: Foxboro

Model: 66 BC-OH

EIIS Code: SJ-IB

Previous Similar Events:

None

ATTACHMENT 1 TO 9310190104 PAGE 1 OF 1

Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
616 465 5901 AEP

INDIANA
MICHIGAN
POWER

September 27, 1993

United States Nuclear Regulatory Commission
Document Control Desk

Rockville, Maryland 20852

Operating Licenses DPR-74
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

93-008-00

Sincerely,

A. A. Blind
Plant Manager

/sb

Attachment

c: J. B. Martin, Region III
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